

First record of the *Pyrrhura lucianii* Deville, 1851 (Psittaciformes, Psittacidae) in Acre, Brazil, with notes on the consumption of salt

Jesus Rodrigues Domingos de Souza,¹ Ricardo Antônio de Andrade Plácido,² Edson Guilherme,³ Tomaz Nascimento de Melo⁴

1 Secretaria de Estado de Meio Ambiente do Acre, Departamento de Áreas Protegidas e Biodiversidade, Rua Benjamin Constant, 856, CEP 69900-160, Rio Branco, Acre, Brazil. **2** Instituto Nacional de Pesquisas da Amazônia, Programa de Pós-Graduação em Gestão de Áreas Protegidas na Amazônia, Av. André Araújo, Petrópolis, 2936, CEP 69067-375, Manaus, Amazonas, Brazil. **3** Universidade Federal do Acre, Laboratório de Ornitologia, Centro de Ciências Biológicas e da Natureza, Rodovia BR 364, km 4, Distrito Industrial, CEP 69915-900, Rio Branco, Acre, Brazil. **4** Universidade Federal do Amazonas, Programa de Pós-graduação em Zoologia, Av. General Rodrigo Otávio, 1200, Coroado I, CEP 69067-005, Manaus, Amazonas, Brazil.

Corresponding author: Tomaz Nascimento de Melo, tomazramphotrigon@gmail.com

Abstract

The Brazilian endemic species *Pyrrhura lucianii* Deville, 1851, was found on private property in the municipality of Senador Guiomard in Acre State, Brazil. This is the first record of this parakeet species in the state, expanding its distribution in 219 km to the south of Pauini, the nearest location. The species was observed consuming salt, used as a cattle feed supplement.

Keywords

Distribution; salt consumption; southwestern Amazon; parakeet; range extension.

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Introduction

The genus *Pyrrhura* (Psittaciformes, Psittacidae) currently covers 31 species of birds (del Hoyo et al. 2017), which are distributed throughout the Neotropical forests, including those from the Amazon, the Atlantic and Central America and west of the Andes (Ribas et al. 2006). Subtle differences in morphological characteristics and plumage color pattern have made this group a systematic problem at the species level. For Peters (1937), the Bonaparte's Parakeet *Pyrrhura lucianii* Deville, 1851 (Deville 1851: 211) composes the species complex *Pyrrhura picta* Statius Müller, 1776, formed of the subspecies: *P. p. picta* (Statius Muller, 1776), *P. p. eisenmanni* Delgado, 1985, *P. p. roseifrons*

(Gray, 1859), *P. p. lucianii* (Deville, 1851), *P. p. subandina* Todd, 1917, *P. p. caeruleiceps* Todd, 1947, *P. p. pantchenkoi* Phelps, 1977, and *P. p. amazonum* Hellmayr, 1906, but this classification is considered unsatisfactory (Forshaw and Cooper 1989, Joseph 2000). Based on morphological characteristics and color patterns, as well as geographical variation, taxonomy, and distribution of the group, the taxon *lucianii* has raised to full species status (Joseph 2000, 2002), also recognized by the Brazilian Ornithological Records Committee (Piacentini et al. 2015).

Pyrrhura lucianii measures 22 cm, is mostly green, with blue wing tips, red-chestnut tail, a red belly, a scaly front part of the neck, a dark head, and a chestnut-brown

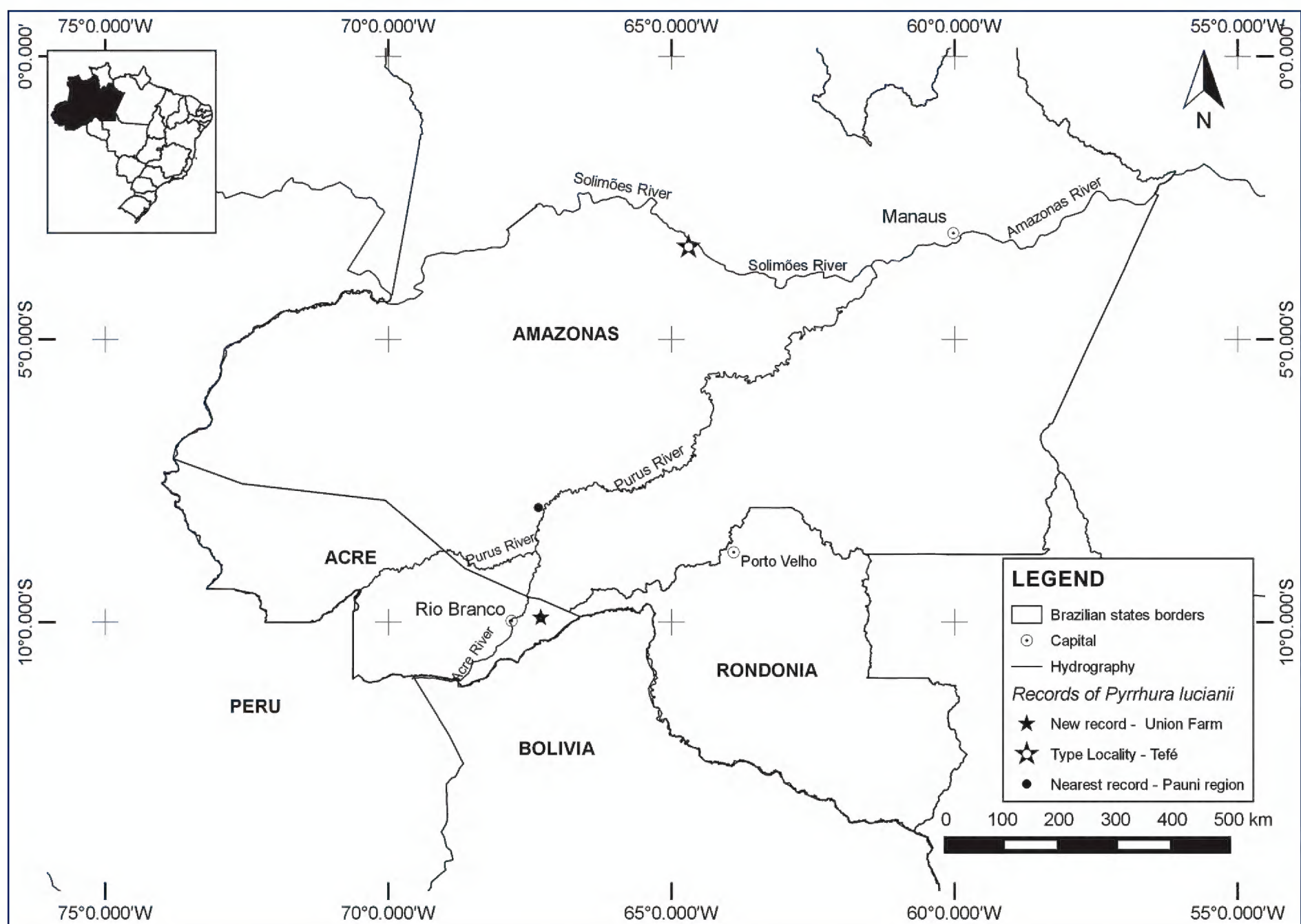


Figure 1. *Pyrrhura lucianii* distribution map, showing the records in Tefé-AM (type locality), Pauni-AM (the closest record), and the new record in Acre state.

face with whitish cheek feathers (del Hoyo et al. 2017). The distribution of *P. lucianii* is restricted to the southern margin of the Solimões river, based in its type locality in Tefé and on part of the Purus river, and it is a Brazilian endemic (del Hoyo et al. 2017). In recent years, the species has been recorded in the southern part of Amazonas State, including the localities of Pauni (Laranjeiras 2013, Fig. 1), Lábrea (Lopes 2014), and Canutama (Oliveira 2016). The reproductive biology as well as ecological aspects of the species are unknown, although its feeding appears to be similar to other species of the genus, which exploit the fruits and seeds of a wide variety of plants (Kristosch and Marcondes-Machado 2001, Ragusa-Netto 2007, Buitrón-Jurado and Sanz 2016). It presumably inhabits mature forest areas in flooded areas (del Hoyo et al. 2017).

Methods

The record was made following expeditions to Fazenda União on 26 January 2017 and 3 February 2017. Fazenda União is a private property of around 100 ha located in the municipality of Senador Guiomard in the eastern region of Acre (Fig. 1). This region is a land access route via the BR 364 to the rest of the country. Its native landscape, which was dominated by open ombrophilous forests (Acre 2006), has been considerably reduced, giving way

to innumerable agricultural ventures. The remaining forest fragments are distributed among agrobusiness projects or private property legal reserves.

Results

New record. Brazil, Acre state, Senador Guiomard municipality (09°55'04" S, 067°17'43" W), Jesus Rodrigues Domingos de Souza, 26 January 2017, 12 individuals (WikiAves WA2454451).

Identification. The species was identified by comparison of the photos with specialized literature (Forshaw and Knight 2010, del Hoyo et al. 2017). The most important characteristics that made us identify the birds observed as *P. lucianii* were the red belly, the dark head and the chestnut region around the eyes (Fig. 2). Two more species of *Pyrrhura* parakeets—the Black-capped Parakeet *P. rupicola* (Tschudi, 1844) and Rose-fronted Parakeet *P. roseifrons* (Gray, 1859)—also occur in Acre (Guilherme 2012, 2016). The main difference of *P. roseifrons* in relation to *P. lucianii* is the very characteristic bright red color on the head and face of the first (Fig. 2), although this characteristic is barely noticeable in young individuals of this species (del Hoyo et al. 2017), and until now, *P. roseifrons* has been recorded only in western Acre (Guilherme 2012, 2016). *P. rupicola* is the biggest of the 3 (25 cm) and differs from *P. lucianii* by the red tips of



Figure 2. Main differences between *Pyrrhura lucianii* (A), *P. roseifrons* (B), and *P. rupicola* (C). The main difference between *P. lucianii* and the others is the head and belly colour pattern.

its wings and the green cheek feathers, but the main difference is the lack of red on its belly, which is present in *P. lucianii* (Fig. 2). On 26 January 2017, JR observed at Fazenda União for the first time a flock of 12 individuals feeding on a guava tree *Psidium guajava* L. 1753 (Fig. 3). During the second visit, on 3 February, we found a group of *P. lucianii* feeding on guava fruit at the same location again. On this occasion, photographic and song records as well as behavioral observations were carried out. After the group fed on the fruits, we observed their displacement to an area of salt deposition. The salt was used to compliment the feed for the cattle herd on the property and it was placed in a wooden trough in the open, half a

meter from the ground. The parakeet group remained on the ground for around 15 minutes and then moved to the edge of the forest, 50 m from the location. The trough remains exposed under the sun and heavy rains that dissolve and carry the salt to the ground, where the birds consumed it. The owner stated that the birds regularly visit his backyard and that they feed on other fruit trees in the area. Questioned with regards to *Pyrrhura* parakeets consuming the salt, he informed us that the birds often visit the trough and the ground, and that no other bird had been seen consuming salt at the site.

Discussion

This is the first record of *P. lucianii* for Acre State, extending its distribution by 219 km to the south from the closest record, located in the municipality of Pauini, in the south of Amazonas State (Laranjeiras 2013, Fig. 1). The species possibly occurs further in adjacent Peru and Bolivia. Our record is the first for *terra firme* forest, because *P. lucianii* had only been recorded in flooded forests previously, and its presence on *terra firme* was only presumed (del Hoyo et al. 2017).

The intentional consumption of soil, or geophagy, is not a new phenomenon among vertebrates. Various groups of birds exhibit this behavior (Emmons and Stark 1979, Wink et al. 1993, Diamond et al. 1999, Burger and Gochfeld 2003) and several theories have attempted to explain their benefits for birds, including: mechanically assisting digestion (Best and Gionfriddo 1991), balancing pH (Kreulen 1985, Mahaney et al. 1999), alleviating diarrhea (Oates 1978, Vermeer and Ferrell 1985, Mahaney et al. 1995b, Mahaney et al. 1996), adsorbing toxins in the diet (Kreulen 1985, Diamond et al. 1999, Mahaney et al. 1999), and mineral supplementation (Kreulen and Jaeger 1984, Klaus and Schmid 1998). Brightsmith and Muñoz-Najar (2004) tested 3 of these theories (mechanically assisting digestion, adsorbing toxins in the diet, and mineral supplementation) for Psittacidae, Columbidae, and Cracidae in the region below the Tambopata river in Peru and showed that the birds chose more saline soils with a higher concentration of exchangeable sodium.

In this study, we did not classify the behavior observed as geophagy *sensu strictu*. Here, it is most properly defined as consumption of salt and also salt water, an unusual and uncommon behavior among birds (Packard 1946). A similar behavior, that is, obtaining salt from a trough located in a pasture, has been reported for the House sparrow *Passer domesticus* (Linnaeus, 1758) (Mousley 1921, Calhoun 1944) and various other species of birds in the United States and Canada (Mousley 1921, 1946, Packard 1946). Based in our observation, *Pyrrhura* species also have this feeding behavior. The consumption of salt water originating from continental rocks has been also reported for parakeets and other birds in Papua New Guinea (Symes et al. 2005). The record of *P. lucianii* in an area of transition between pasture and forest indicates also that this species visits the area in search of fruits cul-

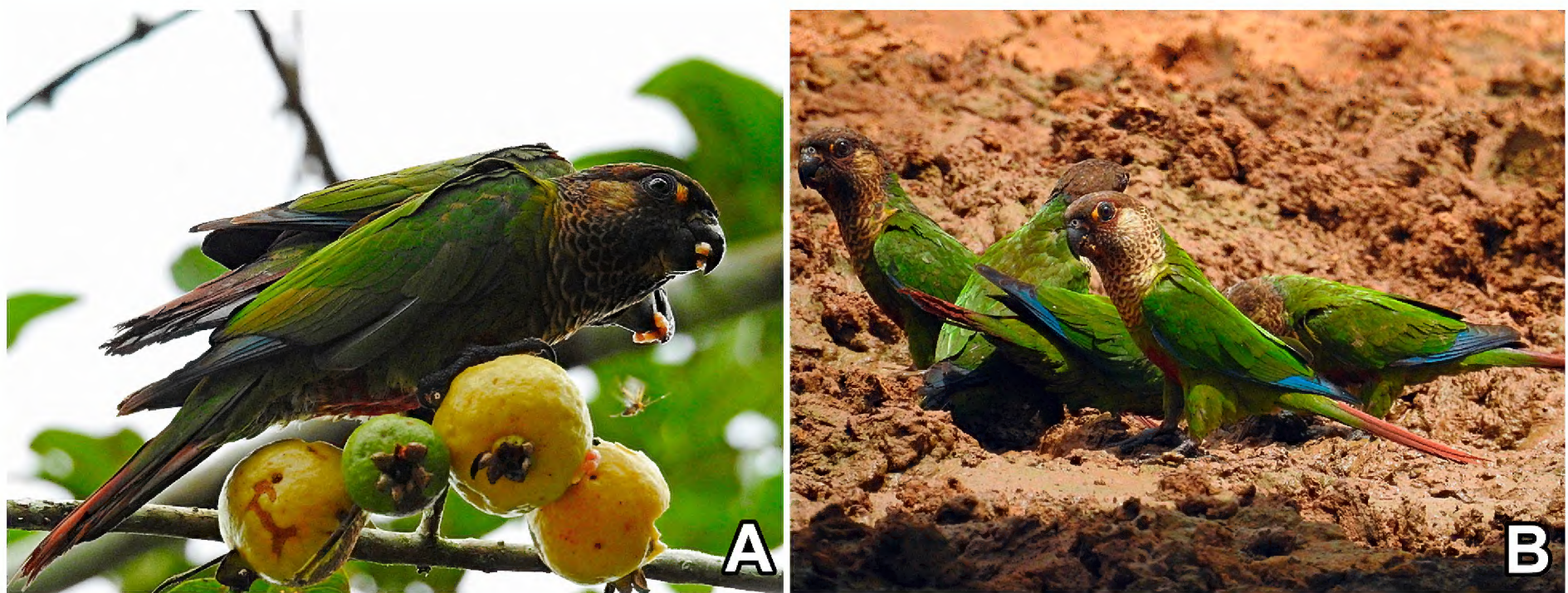


Figure 3. Photographic records of *Pyrrhura lucianii* at Fazenda União. Feeding on the fruit of the guava tree (*Psidium guajava*) (A). Flock landing on the ground and consuming salt (B).

tivated by man, as well as to consume salt at the property, suggesting that species has some flexibility to habitat disturbances.

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Authors' Contributions

JRDS collected the data, JRDR, RAAP, TNM y EG wrote the text and EG, RAAP, TNM identified the species.

References

- Acre (2006) Zoneamento Ecológico-Econômico do Acre Fase II: Documento Síntese – Escala 1:250.000. Secretaria do Meio Ambiente, Rio Branco, 356 pp.
- Best LB, Gionfriddo GP (1991) Characterization of grit use by cornfield birds. *Wilson Bulletin* 103: 68–82.
- Brightsmith DJ, Munõz-Najar RA (2004) Avian geophagy and soil characteristics in southeastern Peru. *Biotropica* 36 (4): 534–543. <http://doi.org/10.1111/j.17447429.2004.tb00348>
- Buitrón-Jurado G, Sanz V (2016) Notes on the diet of the endemic Red-eared Parakeet *Pyrrhura hoematotis* and other venezuelan montane parrots. *Ardeola* 63 (2): 357–367. <https://doi.org/10.13157/arla.63.2.2016.sc2>
- Burger J, Gochfeld M (2003) Parrot behavior at a rio Manu (Peru) clay lick: temporal patterns, associations, and antipredator responses. *Acta Ethologica* 6: 23–34. <http://doi.org/10.1007/s10211-003-0080-y>
- Calhoun JB (1945) English sparrow eating salt. *The Auk* 62: 181–193. <http://doi.org/10.1111/j.1474-919X.1999.tb07540.x>
- Deville E (1851) *Conurus lucianii*. *Revue et Magazin de Zoologie* 2 (3): 211.
- Emmons LH, Stark NM (1979) Elemental composition of a natural mineral lick in Amazonia. *Biotropica* 11: 311–313. <http://doi.org/10.2307/2387925>
- Forshaw JM, Cooper WT (1989) *Parrots of the World*. 3rd ed. Blandford Press, London, 672 pp.
- Forshaw JM, Knight F (2010) *Parrots of the World*. Princeton University Press, New Jersey, 146 pp.
- Guilherme E (2012) Birds of the Brazilian state of Acre: diversity, zoogeography, and conservation. *Revista Brasileira de Ornitologia* 20 (4): 393–442.
- Guilherme E (2016) *Aves do Acre*. Edufac, Rio Branco, 897 pp.
- Hoyo J del, Collar N, Kirwan GM (2017) Bonaparte's Parakeet (*Pyrrhura lucianii*). <http://hbw.com/node/467515>. Accessed on: 2017-2-17.
- Joseph L (2000) Beginning an end to 63 years of uncertainty: the Neotropical parakeets known as *Pyrrhura picta* and *P. leucotis* comprise more than two species. *Proceedings of the Academy of Natural Sciences of Philadelphia* 150: 279–292.
- Joseph L (2002) Geographical variation, taxonomy and distribution of some Amazonian *Pyrrhura* parakeets. *Ornitologia Neotropical* 13: 337–363.
- Klaus G, Schmid B (1998) Geophagy at natural licks and mammal ecology: a review. *Mammalia* 62: 481–497. <http://doi.org/10.1515/mamm.1998.62.4482b>
- Kreulen DA (1985) Lick use by large herbivores: a review of benefits and banes of soil consumption. *Mammal Review* 15: 107–123. <http://doi.org/10.1111/j.1365-2907.1985.tb00391.x>
- Kreulen DA, Jaeger T (1984) The significance of soil ingestion in the utilization of arid rangelands by large herbivores, with special reference to natural licks on the Kalahari pans. In: Gilchrist FMC, Mackie RI (Eds) *Herbivore nutrition in the subtropics and tropics*. Science Press, Johannesburg, 202–221.
- Kristosch GC, Marcondes-Machado LO (2001) Diet and feeding behavior of the Reddish-bellied Parakeet (*Pyrrhura frontalis*) in an Araucaria forest in southeastern Brazil. *Ornitologia Neotropical* 12: 215–223.
- Knezevich M (1998) Geophagy as a therapeutic mediator of endoparasitism in a free-ranging group of Rhesus Macaques (*Macaca mulatta*). *American Journal of Primatology* 44 (1): 71–82. <http://doi.org/b6vn8k>
- Laranjeiras TO (2013) WA1003484. <http://www.wikiaves.com/1003484>. Accessed on: 2017-2-26.
- Lopes EV (2014) WA1923271. <http://www.wikiaves.com/1923271>. Accessed on: 2017-2-26.
- Mahaney WC, Stambolic A, Knezevich M, Hancock RGV, Aufreiter S, Sanmugadas K, Kessler MJ, Grynps MD (1995b) Geophagy amongst Rhesus Macaques on Cayo Santiago, Puerto Rico. *Primates* 36: 323–333. <http://doi.org/10.1007/BF02382856>
- Mahaney WC, Hancock RGV, Aufreiter S, Huffman MA (1996) Geo-

- chemistry and clay mineralogy of termite mound soil and the role of geophagy in chimpanzees of the Mahale Mountains, Tanzania. *Primates* 37: 121–134. <http://doi.org/10.1007/bf02381400>
- Mahaney WC, Zippin J, Milner MW, Sanmugadas K, Hancock RGV, Aufreiter S, Campbell S, Huffman MA, Wink M, Malloch D, Kalm V (1999) Chemistry, mineralogy and microbiology of termite mound soil eaten by the chimpanzees of the Mahale Mountains, western Tanzania. *Journal of Tropical Ecology* 15: 565–588.
- Mousley H (1921) Goldfinches and Purple Finches wintering at Hatley, Stanstead County, Quebec. *The Auk* 38: 606.
- Mousley H (1946) English Sparrow eating salt. *The Auk* 63: 89.
- Oates JF (1978) Water-plant and soil consumption by Guereza Monkeys *Colobus guereza*: a relationship with minerals and toxins in the diet? *Biotropica* 10: 241–253. <http://doi.org/10.2307/2387676>
- Oliveira UM (2016) WA2148236. <http://www.wikiaves.com/2148236>. Accessed on: 2017-2-26.
- Packard FM (1946) Some observations of birds eating salt. *The Auk* 63: 89.
- Peters JL (1937) Check-list of Birds of the World, vol. 3. Harvard University Press, Cambridge. 311 pp.
- Piacentini VQ, Aleixo A, Agne CE, Maurício, GN, Pacheco JF, Bravo GA, Brito GRR, Naka LN, Olmos F, Posso S, Silveira LF, Betini GS, Carrano E, Franz I, Lees AC, Lima LM, Pioli D, Schunck F, Amaral FR, Bencke GA, Cohn-Haft M, Figueiredo LFA, Straube FC, Cesari E (2015) Annotated checklist of the birds by the Brazilian Ornithological Records Committee. *Revista Brasileira de Ornitologia* 23 (2): 91–298.
- Ragusa-Netto J (2007) Feeding ecology of the Green-cheeked Parakeet (*Pyrrhura molinae*) in dry forests in western Brazil. *Brazilian Journal of Biology* 67 (2): 243–249.
- Ribas CC, Joseph L, Miyaki CY (2006) Molecular systematics and patterns of diversification in *Pyrrhura* (Psittacidae), with special reference to the *picta-leucotis* complex. *The Auk* 123 (3): 660–680. <http://doi.org/fjz5js>
- Symes CT, Hughes JC, Mack AL, Marsden SJ (2005) Geophagy in birds of Crater Mountain Wildlife Management Area, Papua New Guinea. *Journal of Zoology* 268: 87–96. <http://doi.org/10.1111/j.1469-7998.2005.00002.x>
- Vermeer DE, Ferrell RRJ (1985) Nigerian geophagical clay: a traditional antidiarrheal pharmaceutical. *Science* 227: 634–636. <http://doi.org/10.1126/science.3969552>
- Wink M, Hofer A, Bilfinger M, Englert E, Martin M, Schneider D (1993) Geese and dietary allelo-chemicals—food palatability and geophagy. *Chemoecology* 4: 93–107. <http://doi.org/10.1007/bf01241679>